DOCUMENT RESUME

ED 318 149 EC 230 551

AUTHOR Nordlund, Marcia R.
TITLE Traumatic Brain Injury as a Cause of Behavior Disorders.
PUB DATE Sep 89
NOTE 14p.; Paper presented at the National Conference of the CEC/Council for Children with Behavioral Disorders (Charlotte, NC, September 24-26, 1989).
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Behavior Change; *Behavior Disorders; Classroom Techniques; Elementary Secondary Education; Emotional Disturbances; *Injuries; Intervention; *Neurological Impairments; *Neurology; Perceptual Handicaps; Seizures; Teaching Methods
IDENTIFIERS *Head Injuries

ABSTRACT

There is increasing evidence that many children and adolescents who display behavior disorders have sustained a traumatic brain injury. Traumatic brain injury can take the following forms: closed head trauma in which the brain usually suffers diffuse damage; open head injury which usually results in specific focal damage; or internal trauma (e.g., tumors or lack of oxygen) with results either focal or diffuse. The brain is usually divided into individual sections (brain stem, cerebellum, and cerebrum, which in turn is divided into the frontal, parietal, occipital, and temporal lobes). Frontal lobe damage may result in disinhibition, lack of executive planning skills, and emotional lability, while perceptual deficits may result from damage to the temporal or occipital lobes. Temporal lobe seizures may be associated with impulsivity and violent outbursts. Psychiatric impairment may be a direct result of the injury or due to the injury's after-effects. In the behavior disordered classroom, teaching methods such as behavior modification, humanistic techniques, or contracting, which are effective with non-brain injured behavior disordered students may not be as effective with the brain injured child. In some cases, it may be more effective to regulate the child's environment to minimize the occurrence of behavior disorders. Contains 12 references. (DB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED318149

TRAUMATIC BRAIN INJURY AS A CAUSE OF BEHAVIOR DISORDERS

Abstract

Many children and adolescents who display behavior disorders have sustained a traumatic brain injury. Although the manifestations of their injury results in behavioral characteristics similar to their non-injured counterparts, the remedial methods for this population must take into account the etiology of the disorder. By understanding the functions of the lobes of the brain and how damage to these areas can effect learning and behavior, a teacher of behavior disorder students can institute a effective plan of intervention.

Marcia R. Nordlund

Paper presented at the National Conference of the Council for Exceptional Children Council for Children with Behavioral Disorders (Charlotte, NC, September 24-26, 1989)

EC 230551

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Marcia R Nordlund
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

TRAUMATIC BRAIN INJURY

AS A CAUSE OF BEHAVIOR DISORDERS

At a 1986 conference on violence at the annual meeting of the American Association for the Advancement of Science, doctors said their studies indicated that seemingly unprovoked acts of violence can be linked to head injuries and brain damage. An article in the American Medical News (October 1985) states that "Teen-age juvenile offenders who committed violent crimes had eight times the incidence of brain damage as did non-violent offenders." In a 1986 study of death row inmates, results indicated that every inmate studied had a history of severe head injury (Lewis et al., 1986). In a study conducted by Brown, Chadwick, Shaffer, Rutter, & Traub (1981), results indicated that social inappropriateness was three times greater in severely head injured persons as in matched controls.

Traumatic brain injury is defined as damage to a living brain tissue that is caused by an external, mechanical force. (Vogenthaler 1987). This definition indicates that a traumatic brain injury is exactly as its name implies: traumatic. In this context, head injury is an acquired impairment, not congenital. Traumatic brain injury is the leading cause of death and neurological disability among children (Elben, Anderson, Lockman, Matthews, Dryja, Martin, Burrill, Gottesman, O'Brain, & Witte, 1984; Rivara, & Meuller, 1986; Baker, O'Heill, & Karpf, 1984). More than one

million children each year sustain a head injury. Many of these traumas have no significant outcome; however, 16,000 to 20,000, will suffer injuries serious enough to cause permanent effect (Mira et al., 1988). Many times there is no visual sign of impairment; therefore, many children suffer minor head trauma, and there is a lack of awarenes regarding the ramifications which may occur as a result of head injury.

A typical scenario could occur as follows. A child is playing on a playground and collides with another student. The child appears a bit shaken and is taken to the local hospital emergency room. Because there is no loss of consciousness, the doctors diagnose the problem as a mild concussion and send the patient home. Shortly thereafter, the child begins a slight behavior change which the parents disaccount as "part of growing up." These behavioral deficits become more and more noticeable until the school recommends special placement in a Behavior Disorder classroom. Because the behavioral changes are gradual, the cause is not traced to the mild head trauma suffered previously. The connection between disruptive behavior and brain injury is even more difficult to discover if the cause of the head trauma is abuse or neglect.

Understanding Head Trauma

An acquired brain injury occurs whenever there is a structural change of the soft tissue in the central nervous

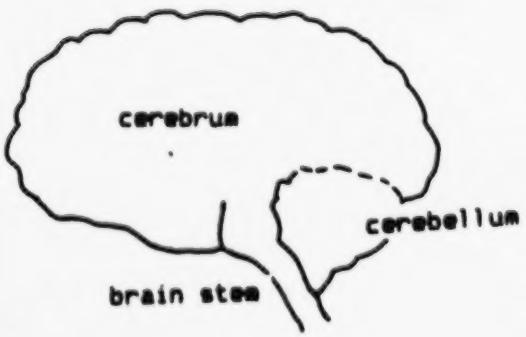
system above the spinal cord (Cook 1986). This change can be a result of either external or internal trauma. External trauma can either be classified as closed head trauma or open head wounds. Closed head trauma involves a moving object striking a stationery head which causes a sudden jolt or movement of brain tissue. This type of trauma is called acceleration and is generally caused by an object striking the head as in assault or abuse. Alternately, closed head trauma can be a result of a moving head being suddenly stopped by a stationery object. This would be the case of a person strikes the windshield in an automobile accident. In both of these types of external trauma, the brain suffers diffuse damage.

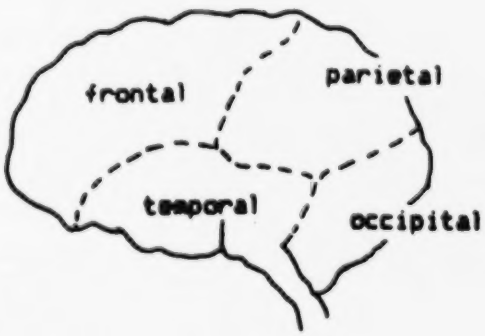
The counterpart to external injury is an open head wound. This trauma is a penetrating tissue wound, generally caused by a foreign object entering the brain. This object tears a path in the soft tissue of the brain. Often the cause is a gun shot, accident, or abuse. The main differentiation is that an object penetrates the skull. Contrary to a closed head injury, an open head injury generally results in focal damage, specific in nature although the damage can be diffuse.

Traumatic brain injury can also be the result of internal trauma to the brain. Tumors, anoxia (lack of oxygen due to drowning, surgery, ingestion of toxic substances), infections of the brain (encephalitis, meningitis), hypoxia (failure of the brain to absorb oxygen), aneurysm (ballooning

of the vascular area of the brain), and cerebral vascular accident (stroke) are common causes. Focal brain damage is often the consequence of such insults to the brain; however, the damage can be diffuse as well.

For medical purposes, the brain is often divided into three sections. The brain stem is the section of the brain which connects the trunk of the brain to the spinal cord. This area is the conduction pathway for motor activities and is responsible for most life-supporting functions such as heartbeat, respiration, and blood pressure. The cerebellum, located at the back of the skull, is the motor area of the brain responsible for subconscious movements of the skeletal muscles which control coordination, balance, and posture. The cerebrum forms the bulk of the brain and is responsible for most cognitive thinking. It is divided into sections or lobes which help to define the activity of each.





The frontal lobe, located in the front portion of the

brain, controls personality stability as well as important personality and emotional functions. This lobe mediates such capabilities as attention, insight (awareness of how one's behavior effects others), judgement (reasoning ability), emotional regulation (regulation of moods in order to maintain a balanced social disposition), and inhibition (self regulation of words and actions). If traumatic damage occurs to the area of this brain, the result is often inappropriate behavior such as aggression, impulsiveness, agitation, and disinhibition.

The parietal lobe, located near the upper back of the brain, is the sensory area of the brain. This lobe is responsible for localizing the origins or sensations on the body as well as integrating and interpreting sensations. In addition, the base of the area is associated with understanding and carrying out complex actions needed for speech.

The occipital lobe is the visual perceptual area of the brain. This area evaluates visual data and relates new visual data to past visual experiences.

The temporal lobe is primarily responsible for auditory perception as well as the sensations of smell and taste. The hippocampus which controls short term memory is located in this area. The temporal lobe has also been associated with basic intellectual, emotional, and sexual activities.

RELATING BRAIN INJURY TO BEHAVIOR

As stated previously, insult to the brain can often lead to specific or focal damage. Such is generally true with cerebral vascular accident (stroke). Through the use of EEG results and neuropsychological testing, it is relatively easy to pinpoint the damaged area of the brain. Although specific areas of the brain may be significantly damaged, the rest of the brain remains functional.

When diffuse damage occurs to the brain, most areas of the brain appear to be involved. The child returning to school following a head injury may show signs of frontal lobe damage demonstrated by disinhibition, lack of executive planning skills, and emotional lability. At the same time, the child may also be diagnosed as Learning Disabled due to significant auditory and visual perception deficits controlled by the temporal or occipital lobes. Similarly, a speech and language deficit may be noted (Brocca's area and parietal lobe). All of this may be the result of minor head trauma which may be undiagnosed.

Many behavioral symptoms can be a direct result of a traumatic injury to the brain. Certain processes are controlled by inhibitory neurons of the central nervous system. When these neurons are damaged, the result is often disinhibition, the ability to self-regulate words and actions. It has been said that the "what is in the mind is

on the tongue". Whatever the head injured child is thinking is spoken, even if these statements are inappropriate or hurtful. The child is unable to inhibit these comments and "think before acting". This lack of regulation can also lead to aggression and agitation. When the child is stressed or provoked, uncontrolable anger may be the bi-product. Many of these students are labeled with DSM III diagnosis of "Intermittent Explosive Disorder".

Another impairment of central nervous system impairment may be lability or instability of the affective domain. Many head injured students demonstrate abrupt mood changes without provocation. They may switch from one emotional state to another with nothing prompting the change.

Temporal lobe seizures are sometimes associated with impulsivity. Unpredictable actions may be maladaptive leading to disruptive or violent outbursts. The teacher working with a child who has suffered damage to the temporal lobe may be frustrated when attempts to control impulsivity fail. This characteristic of traumatic brain injury tends to persist although some degree of control is available.

Children and adolescents with premorbid psychiatric problems are at increased risk for the development of early and late post-traumatic psychiatric sequelae (Rosen 1985). Memory and somatonsensory impairments can lead to depression and anxiety. Psychiatric impairment may be a direct result of the brain damage sustained or may be a secondary impairment due to the after-effects of the injury. Physical

and cognitive deficits generally improve during the first year post-morbid, whereas psychiatric impairments generally emerge near the end of the first year. It is near the end of the first year post-trauma when the child or adolescent begins to realize that physical deficits still remain and will continue to remain. This mourning of the loss of one's previous self can lead to psychiatric disturbances. Other contributing factors may include seizure disorders, significant degree of cognitive impairment, abnormal EEG, and a premorbid history of psychiatric problems.

UNDERSTANDING THE TRAUMATICALLY BRAIN INJURED STUDENT IN THE BEHAVIOR DISORDERED CLASSROOM

Although the outward manifestations of behavior may appear similar, there are many differences between the head injured child in the BD classroom and the child who has not sustained a head injury.

The use of behavior modification can often produce impressive results with the behavior disordered student. When the BD student is positively reinforced for appropriate behavior and helped to understand the consequences for negative behavior, positive behavioral changes often occur. With head injured students, behavior modification may not be as effective a tool for behavior change. If brain injury is the cause of maladaptive behavior, the child may not have

enough control over behavior to institute positive change. Behavior modification may help to alleviate some undesirable behavior but may not control impulsive outbursts or disinhibition. This is not to say that a structured program of applied behavioral analysis is not appropriate; teachers should be aware that these programs may not be as effective with head injured students as with their non-injured classmates.

Similarly, the head injured student may not have enough cognitive functioning to be able to utilize Humantistic techniques of Carl Rogers or William Glasser. The child may not know the reason behind the inappropriate behavior or may not be able to express the underlying feelings. These methods are certainly appropriate to employ as long as the teacher understands the possible limitations with this population.

Contracting may be a constructive method of instituting positive behavioral change although this method, too, has its limitations with head injured students. Memory impairment is one of the most common characteristics of traumatically brain injured students. These students often have short term memory deficits which is demonstrated by the inability to store new information and to retrieve information. Although contracting can be an effective tool, these memory impairments can make contracting ludicrous. If the student is unable to remember the agreed upon contract, the method is worthless.

The ultimate question which must be addressed is whether the educator must help to manage the student or help to manage the environment of the student. If the head injured student has the cognitive and emotional ability to effect positive behavior changes through the use of behavior modification, contracting, or understanding feelings and causes of maladaptive behavior, then these methods of intervention are appropriate for use. If, however, the consequences of head injury have significantly impaired the student's memory, cognitive ability, or emotional lability, it may be more appropriate to manage the child's environment. Controlling frustration, changing activities when frustration or aggression occur, and avoiding overload of emotion and cognitive functioning may be more beneficial to the student and the entire class. As the child matures both cognitively and emotionally, self-regulatory techniques may be instituted.

CONCLUDING REMARKS

Educators have long understood the importance of viewing each child as an individual with unique needs. Students placed in a Behavior Disorder classroom who have sustained a traumatic brain injury may benefit from the program more fully if the teacher is aware of the etiology of the child's behavioral disturbance. Traditional behavioral strategies can be effective with brain injured students, but these

techniques may need modification in order to meet the special needs of this population. Consideration of the specific brain dysfunction can help to lead to an individualized plan of remediation. An analysis of current behavioral deficits and specific brain injury may help the educator to devise methods of intervention. With this type of support, the traumatic brain injured student may achieve academic and behavioral success.

REFERENCES

Baker, S.P., O'Neill, B., & Karpf, R.S. (1984). The injury fact book. Lexinton, MA: Lexinton Books.

Brown, G., Chadwick, D., Shaffer, D., Rutter, M., & Traub, M. (1981). A prospective study of children with head injuries. III. Psychiatric sequelae. Psychological Medicine, 11, 63-78.

Chadwick, O., Rutter, M., Brown, G., Shaffer, D., & Traub, M. (1981). A prospective study of children with head injuries: II. Cognitive sequelae. Psychological Medicine, 11, 49-61.

Cook, J. (Ed.) (1986). The ABI handbook: Serving students with acquired brain injury. Thousand Oaks, Califlornia: Consortium for the Study of Programs for the Brain Injured in California Community Colleges.

Elben, C.F., Anderson, T.P., Lockman, L., Matthews, D.J., Dryja, R., Martin, J., Burrill, C., Gottesman, N., O'Brian, P., & Witte, L. (1984). Functional outcome of closed head injury in children and young adults. Archives of Physical Medicine and Rehabilitation, 65, (4), 168-170.

Goldstein, F.C., & Levin, H.S. (1985). Intellectual and academic outcome following closed head injury in children and adolescents: Research strategies and empirical findings. Developmental Neuropsychology, 1, 195-214.

Krieger, L. (1985). Brain damage linked to violent behavior. American Medical News, 18-21.

Lewis, D., Pincus, J., Feldman, M., Jackson, L., & Bard, B.(1986). Psychiatric, neurological, and psychoeducational characteristics of 15 death row inmates in the united states. American Journal of Psychiatry 143:7, 838-845.

Mira, M., Tyler, J., & Tucker, B. (1988). Traumatic head injury in children: A guide for schools. University of Kansas Medical Center.

Rivara, F.P., & Mueller, B.A. (1986). The epidemiology and prevention of pediatric head injury. Journal of Head Trauma Rehabilitation, 1, (4), 7-15.

Rosen, C.D., & Gerring, J.P. (1986). Head Trauma: Educational reintegration. San Diego, CA: College Hill Press.

Vogenthaler, D. (1987). An overview of head injury: its consequences and rehabilitation. Brain Injury, 1, (1), 113-127.